A METHODOLOGICAL STUDY FOR QUANTITATIVE EVALUATION OF ENERGY RESOURCES TRANSPORTATION RISK BY EVENT TREE ANALYSIS

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Abstract

A new quantitative evaluation methodology for transportation risk is proposed by applying the concept of ETA (Event Tree Analysis), which has been conventionally used for the risk analysis of various plant hazards. The crucial points of the proposed method lie in that it will use the ETA for describing various scenarios where the combination of various political events foreseen both domestically and internationally, would give rise to transportation risk, and that it will conduct a brain storming by participation of various specialists to reach the consensus for the evaluation results related with the possibility and effect of the scenario at hand. As a case study, a brain storming was conducted to evaluate probable transportation risk caused by interruption of sea lane for transporting energy resources in Asia-Pacific region, in order to show the detailed process of applying the proposed methodology for brain storming work by specialists, and to compare the effect of policy options available to avoid transportation risk.

Proposed method

Process detail of proposed method to evaluate the energy resources transportation risk is as follows.

Step1. Cerate various scenarios from brain storming by specialists, which can be expect to cause energy resources transportation risks for each sea lane in Asia-Pacific region.

Step2. Evaluate the possibility of occurrence for each created scenario using ETA in order to derive transportation risks for each sea lane.

Step3. Propose energy policies to avoid transportation risks for each sea lane. Evaluate effectiveness of each proposed energy policy by clarifying processes and factors to reach the final events yielded by the brain storming for each created scenarios, and evaluating the influence of transportation risk occurrences.

Conclusion

Possibility of transportation risk occurrence in each sea lane and effectiveness of energy policies to avoid transportation risk was successfully evaluated by proposed method. The advantage of applying ETA to evaluate transportation risk has suggested by the case study of transportation risk of sea lane located in Asia-Pacific region.